Declaration of Bert Leung

Redacted Version of Document Sought to be Sealed

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Attorneys for Defendant Google LLC

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA, OAKLAND DIVISION

CHASOM BROWN, *et al.* individually and on behalf of all similarly situated,
 	
    Plaintiffs,
 	
    v.
 	
GOOGLE LLC,
 	
    Defendant.
	Case No. 4:20-cv-5146-YGR-SVK
	
	DECLARATION OF BERT LEUNG RE: ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
	
	The Honorable Susan van Keulen

Case No. 4:20-cv-03664-YGR-SVK

DECLARATION OF BERT LEUNG RE: ▮▮▮▮▮▮▮▮▮▮

I, Wing Pan "Bert" Leung, declare as follows:

1.   I am currently a Software Engineer, tech lead, and manager for Ads Identity & Infrastructure at Google and have been employed at Google for the past eight years. As a result of my role and responsibilities, I am familiar with signals sent from Chrome browsers to Google in ad requests, as well as a ██ ██████████████████████████████. Except where otherwise indicated, I make this declaration based on my own personal knowledge and could competently testify thereto.

2.   I received a litigation hold for this matter on December 15, 2020.

3.   In 2019, I worked with Chris Liao on a project to ██████████████████████ ██ This was related to Google's ███ ██ ████████████████████████████████. (A "signal" is information sent from the browser for a dedicated purpose.)   Therefore, ████████████████████████████████ ██ ██ ███████████████████████████████████.

4.   There are two primary hurdles with inferring Incognito mode traffic from the absence of the X-Client-Data header, which I discuss in turn below.

5.   *First*, assuming one has accurately identified all Chrome traffic, ████████████ ██ ████. Therefore, relying on the X-Client-Data header in Chrome traffic to indicate Incognito mode will erroneously count traffic from non-Incognito sessions as traffic from Incognito sessions.

6.   *Second*, this heuristic relies on being able to accurately identify all Chrome traffic.

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DECLARATION OF BERT LEUNG RE ████████████████████████████████

1 The X-Client-Data header is only sent from Chrome browsers; other browsers will not send an X-

2 Client-Data header. It is therefore necessary to isolate Chrome traffic from all of the other browser

3 traffic that does not include X-Client-Data header. Another header, the user-agent header, is used

4 to determine whether a request came from a Chrome browser. Unfortunately, however, the user-

5 agent is one of the easiest HTTP headers to spoof and manufacture. Therefore, this method will

6 falsely count all traffic coming from browsers in which the user-agent has been altered to indicate

7 it is coming from a Chrome browser. Altering user-agent is not a theoretical concern. Apple's Safari

8 browser has a built-in feature that permits users to spoof a Chrome user-agent and there are Mozilla

9 Firefox add-ons that fulfill the same function.

10   7.   I understood then, and understand now, ██████████████████████████████

   ██

   ██

13   8.   In May 2020, my supervisor Chris Liao tasked Mandy Liu and myself with using the

14 same heuristic-based[1] method to approximately infer Chrome Incognito traffic using the X-Client-

15 Data header and ████████████████████████████████ In particular, we sought to

16 ██ Like earlier

17 efforts in 2019, the ██████████████████████ needed only a ████████████████████████

   ██

   ██

   ██

   ██

22   9.   I approved that an output of our project would be a ██████████████████

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25 [1] In computer science, we refer to such an approximate trial-and-error method as a "heuristic."

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10. ▮ ▮ ▮ all ▮ ▮ ▮ ▮
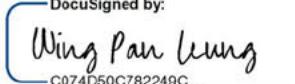
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DECLARATION OF BERT LEUNG RE:

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4   11.   I have reviewed the November 18, 2021 declaration of Google employee Andre

5   Golueke previously filed with the Court in this case. Two of the logs identified above ██████

6   ██████ and ██████████████) appear in Exhibit A of Mr. Golueke's

7   declaration.

8   12.   The ████████████ for Search and Display Ad Serving that uses the

9   '████████████████████████████

10   ████████████████.

11   13.   In connection with the project, we drafted design documents that guided our efforts.

12   These are types of documents we often prepare in our work at Google for new projects. Design

13   documents explain the technical and engineering steps required by a project, such as the software

14   tools to be employed and include high-level details about a project's status and purpose.

15

16   I declare under penalty of perjury of the laws of the United States that the foregoing is true

17   and correct. Executed in Mountain View _____, California on April 4, 2022.

18   DocuSigned by:

19   *Wing Pan Leung*
                                                              C074D50C782249C...

20   Bert Leung

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